QuakeSim Portal Installation Guide

Software Version 0.1
Author: Marlon Pierce

System Overview and Supporting Documentation

This guide describes the installation process for setting up the QuakeSim Computational Web Portal. For background information, design documents, and system capabilities, please refer to QuakeSim information web site, http://www-aig.jpl.nasa.gov/public/dus/quakesim/milestones.html. Additional information may be found at http://www.servogrid.org.

In order to install the QuakeSim portal software, it is necessary to understand the system architecture. Detailed information may be obtained from the design documents; we only review the system here.

QuakeSim is designed to support distributed execution of third party scientific applications. The portal system consists of a single **User Interface Server** (UIS) and one or more **Server Providers** (SP). These are Web service-enabled web servers that may physically reside on the same or separate machines. The general architecture of the system as depicted in Figure 1.

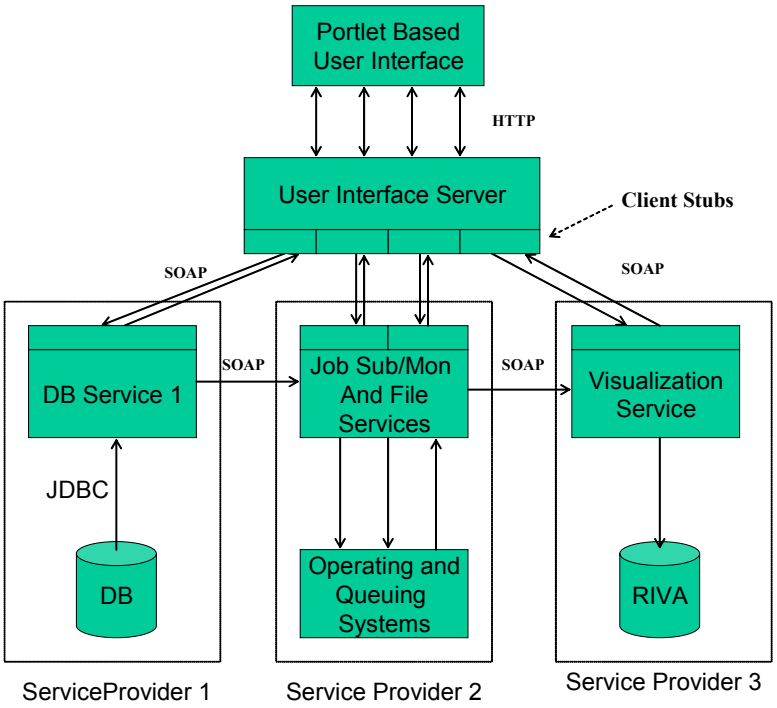

Figure 1 QuakeSim portal architecture

The figure depicts three example service sets: DB access; Job submission, monitoring, and file access; and visualization services.

The QuakeSim portal is built with both newly developed and third party software. We provide two bundles:

- The UIS Bundle: provides everything needed to set up a User Interface Server. Includes Apache Tomcat, Jetspeed, and Apache Axis, as well as QuakeSim portal software.
- The SP Bundle: provides everything needed to set up a Service Provider. Includes Apache Tomcat, Apache Axis, and QuakeSim portal software.

Third party software is described in the next section.

These installations assume familiarity with the UNIX operating system.

Preparing for Installation: Hosts, Development Kits, and Third Party Software

Server Hosts

You should first identify the host machine(s) that you want to use to install and run the portal system. All QuakeSim code is written in Java; however, certain components (external system calls, interactions with the file system) have not been tested for true platform independence. QuakeSim software has been tested and will work on the following platforms/operating systems.

1. PC: Redhat Linux 7.x and higher.
2. Sun: Solaris 2.7 and higher
3. SGI: IRIX 6.x and higher

No particular shell is preferred. However, most applications were developed and tested using the bash shell.

Compilers, SDKs, and Build Tools

All software (including third party) is written in Java. You should install the Java 2 SDK v 1.4.x or higher on all hosts. You should verify that your Java installation has both the compiler (javac) and the runtime bytecode interpreter (java) in the $PATH. You may use the Java interpreter to verify the version of the installation:

[shell prompt> java –version.

The UIS and SP bundles are installed using **Apache Ant**. You should install Ant v 1.5.x or higher on all hosts and should put Ant's bin directory in your $PATH. This directory includes the "ant" executable that will be needed to install the system bundles. See http://ant.apache.org/ for information, downloads, and installation instructions.

Third Party Software

The following third party software is used in this release. You need to download and install Tomcat. Jetspeed and Axis are included in the release.

- **Apache Tomcat Web Server v 4.x:** Tomcat servers are run on all hosts. See http://jakarta.apache.org/tomcat/ for more information. *You must download and install Tomcat 4.0.x or Tomcat 4.1.x.*
- **Jetspeed v 1.4:** Jetspeed is a web application that runs in the UIS tomcat server. See http://jakarta.apache.org/jetspeed/site/index.html. *Jetspeed is included in the release, with extensions.*
- **Apache Axis v 1.0:** Axis is a Web Service hosting environment that runs as a web application in Tomcat. Axis also includes tools for deploying and managing services and for creating client side stubs. *Axis is included in our release, with specific service implementations.*

Installing the UIS Bundle

YOU MUST FIRST INSTALL TOMCAT 4.X before proceeding.

After setting up your UIS host environment as described above, download the package UISBundle.tar.gz from the following link: http://www.servogrid.org/slide/GEM/Interop/Downloads/UISBundle.tar.gz. It is recommended that you use the Gnu tar utility; vendor-supplied tar utilities (particularly Sun's) have problems with long directory path names. Also, make sure that the ant executable is in your $PATH. You may also use the full path to the ant command if you prefer.

Unpack the Files

Place the tar package in the home directory where you plan to run the UIS software. It is recommended that you do this with a regular (UNIX) user account. To unpack the system software, use the following shell command:

```
[shell prompt> tar –zxf UISBundle.tar.gz
```

This assumes you have Gnu tar installed and in your $PATH. If you do not (and your tar command does not recognize the –z option), you may use the following commands:

```
[shell prompt> gunzip UISBundle.tar.gz
[shell prompt> tar –xf UIBundle.tar
```

In either case, unpacking the bundle will create a directory called UIBundle. Move into this directory.

```
[shell prompt> cd $HOME/UIBundle
```

Edit Configuration Information

Next, open the file "build.properties" file and set the following values:

```
###
# Apache Ant build parameters.  Please change to appropriate values.
###
installation.home=/your/home/your-tomcat
java.home=/path/to/installed/java
base.server.url=http://localhost:8080/
```

The property "tomcat.home" should be set to the base directory where you run Tomcat. For example, if you have created an account called "webportal" on your Linux host and installed Tomcat 4.1.24, you would set tomcat.home=/home/webportal/jakarta-tomcat-4.1.24. The UIS will be install two subdirectories in Tomcat's webapps directory: GCWS and Jetspeed.

The java.home property should point to the base installation directory of java. This is typically something like /usr/java/j2sdk1.4.1_02. This directory must contain as its subdirectories jre and bin. To test that you have set this correctly, try the following command:

```
[shell prompt> {/path/to/installed/java}/bin/java –version
```

where {/path/to/installed/java} should be changed to your installation directory.

Finally, set the base.server.url property to be your server's URL. You can also use localhost or 127.0.0.1 for the configuration options used here. You must include the port number. The default setting for Tomcat is 8080.

Deploy the UIS Software

From the $HOME/UIBundle directory, run the following command.

```
[shell prompt> ant
```

Make sure that you have ant in your $PATH, or else use the full path the to executable. This will use the file build.xml and the properties build.properties to install all software. In particular, this will create a directory jakarta-tomcat-4.1.24 in your base installation directory. All other software is a subdirectory of jakarta-tomcat-4.1.24.

Configure UIS Properties

To complete the installation, you should open and edit the file $TOMCAT_HOME/webapps/GCWS/WEB-INF/conf/GEMDSTEST.properties.
You must change the first set of properties labeled SOAP SERVER URLS. The format of these entries should be

```
my.server.dns.name=http://my.server.dns.name:port/GCWS/services
```

You need one of these entries for each of the SP servers that you use. If you add a new SP, you must edit this file and restart the UIS's tomcat server.

Start and Check the UIS

To start the Tomcat web server (and thus all deployed applications), use the following command:

[shell prompt> $TOMCAT_HOME/bin/startup.sh

This will start the web server on port 8080 by default. To change this port, you should edit the file $TOMCAT_HOME/conf/server.xml, as described in the Tomcat documentation.

To check that the server is running and the UIS is installed, point a Web browser to http://your.server.name:8080/jetspeed. You can log in using the default account/password gateway/gateway.

To shut down the UIS, run the command

[shell prompt> $TOMCAT_HOME/bin/shutdown.sh

Installing the SP Bundle

After setting up your SP host environment as described above, download the package SPBundle.tar.gz from the following link: http://www.servogrid.org/slide/GEM/Interop/Downloads/SPBundle.tar.gz. These instructions are essentially the same as for the UIS bundle. *Note that the installation packages do not allow you to run the UIS and SP bundles on the same server.*

It is recommended that you use the Gnu tar utility; vendor-supplied tar utilities (particularly Sun's) have problems with long directory path names. Also, make sure that the ant executable is in your $PATH. You may also use the full path to the ant command if you prefer.

Unpack the Files

Place the tar package in the home directory where you plan to run the SP software. It is recommended that you do this with a regular (UNIX) user account. To unpack the system software, use the following shell command:

[shell prompt> tar –zxf SPBundle.tar.gz

This assumes you have Gnu tar installed and in your $PATH. If you do not (and your tar command does not recognize the –z option), you may use the following commands:

```
[shell prompt> gunzip SPBundle.tar.gz
[shell prompt> tar –xf UIBundle.tar
```

In either case, unpacking the bundle will create a directory called UIBundle. Move into this directory.

```
[shell prompt> cd $HOME/UIBundle
```

Edit Configuration Information

Next, open the file “build.properties” file and set the following values:

```
###
# Apache Ant build parameters.  Please change to appropriate values.
###
installation.home=/your/home/your-tomcat
java.home=/path/to/installed/java
base.server.url=http://your.server.8080/
```

The property “tomcat.home” should be set to the base directory where you run Tomcat. For example, if you have created an account called “webportal” on your Linux host and installed Tomcat 4.1.24, you would set tomcat.home=/home/webportal/jakarta-tomcat-4.1.24. The UIS will be install two subdirectories in Tomcat’s webapps directory: GCWS and Jetspeed.

The java.home property should point to the base installation directory of java. This is typically something like /usr/java/j2sdk1.4.1_02. This directory must contain as its subdirectories jre and bin. To test that you have set this correctly, try the following command:

```
[shell prompt> {/path/to/installed/java}/bin/java –version
```

where {/path/to/installed/java} should be changed to your installation directory.

Finally, set the base.server.url property to be your server’s URL. You must include the port number. The default setting for Tomcat is 8080.

Deploy the SP Software

From the $HOME/UIBundle directory, run the following command.

```
[shell prompt> ant
```

Make sure that you have ant in your $PATH, or else use the full path the to executable. This will use the file build.xml and the properties build.properties to install all software. In particular, this will create a directory jakarta-tomcat-4.1.24

in your base installation directory. All other software is a subdirectory of jakarta-tomcat-4.1.24.

Start and Check the SP

To start the Tomcat web server (and thus all deployed applications), use the following command:

```
[shell prompt> $TOMCAT_HOME/bin/startup.sh
```

This will start the web server on port 8080 by default. To change this port, you should edit the file $TOMCAT_HOME/conf/server.xml, as described in the Tomcat documentation.

To check that the server is running and the SP is installed, point a Web browser to http://your.server.name:8080/jetspeed. You can log in using the default account/password gateway/gateway.

To shut down the SP, run the command

```
[shell prompt> $TOMCAT_HOME/bin/shutdown.sh
```